WO02087267

Publication Title:

MOBILE CELLULAR TELECOMMUNICATIONS INFRASTRUCTURE BASED MULTI-USER APPLICATIONS

Abstract:

The present invention is directed toward to the use of Point-To-MultiPoint (PTMP) display messages over a mobile cellular telecommunications infrastructure for supporting a number of multi-user applications including multi-user interactive applications in the case of interactive display messages. Exemplary applications include a consumer survey, a multi-player game, a Content on Demand application, and the staggered broadcast of the same interactive display message over different geographical areas served by different Base Transceiver Stations (BTSs).

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 October 2002 (31.10.2002)

PCT

(10) International Publication Number
WO 02/087267 A1

(51) International Patent Classification[7]: H04Q 7/22

(21) International Application Number: PCT/IL01/00381

(22) International Filing Date: 25 April 2001 (25.04.2001)

(25) Filing Language: English

(26) Publication Language: English

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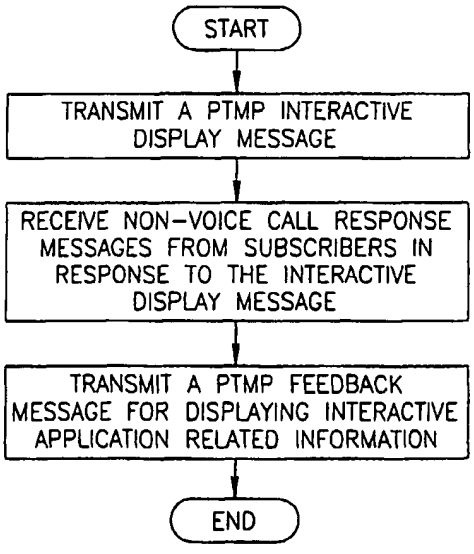
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MOBILE CELLULAR TELECOMMUNICATIONS INFRASTRUCTURE BASED MULTI-USER APPLICATIONS



(57) Abstract: The present invention is directed toward to the use of Point-To-MultiPoint (PTMP) display messages over a mobile cellular telecommunications infrastructure for supporting a number of multi-user applications including multi-user interactive applications in the case of interactive display messages. Exemplary applications include a consumer survey, a multi-player game, a Content on Demand application, and the staggered broadcast of the same interactive display message over different geographical areas served by different Base Transceiver Stations (BTSs).

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MOBILE CELLULAR TELECOMMUNICATIONS INFRASTRUCTURE BASED MULTI-USER APPLICATIONS

Field of the Invention

The invention is in the field of mobile cellular telecommunications in general, and mobile cellular telecommunications infrastructure based multi-user applications in particular.

Background of the Invention

In WO98/10604, there is illustrated and described a method and apparatus for an interactive cell broadcast service employing Point-To-MultiPoint (PTMP) (Short Message Service) SMS messages to subscribers in respect of several interactive applications including voting, subscribing to different cellular services, and the like. The subscribers are prompted to respond by depressing a pushkey for immediately originating either a Point-To-Point (PTP) SMS message telephone call or a telephone call to an embedded callback number.

In WO99/42964, there is illustrated and described a game system in which a plurality of subscribers transmit subscriber game data to at least one central game unit in order to participate in games via SMS messages using mobile telephone devices in a mobile telephone network. The central game unit carries out games according to pre-determined rules and transmits central unit game data to the subscribers' mobile telephone devices via SMS messages through the mobile telecommunications network.

In WO00/22906, there is illustrated and described a method and system for performing electronic auctions using SMS messages between a mobile center in communication with an auction management system and a mobile phone to give information on products, current prices and accept offers, and from a mobile phone to a mobile center in order to make conditional purchase offers.

Summary of the Invention

Generally speaking the present invention is directed toward the use of Point-To-MultiPoint (PTMP) display messages over a mobile cellular telecommunications infrastructure for supporting a number of multi-user applications including multi-user interactive applications in the case of PTMP interactive display messages. The term *"interactive display message"* within the context of the present invention implies that a subscriber can automatically activate a Point-to-Point (PTP) transmission response mechanism, for example, originating a voice call, transmitting an SMS, initiating a WAP session, and the like, from a dedicated response means integrally provided in a display message. The display messages to be displayed on subscribers' personal cellular telecommunications devices may be displayed thereon immediately, displayed in a screen saver like manner when the personal cellular telecommunications device is running a screen saver like application as illustrated and described in Applicant's co-pending PCT International Application claiming priority from Israel Patent Application 134,035, or displayed upon retrieval from an input box. The personal cellular telecommunications devices can include a wide range of mobile handheld devices including *inter alia* simple phones, smartphones, combined PDA/phones, combined MP3 music player/phones, and the like, employing different Operating Systems (O/Ss) including *inter alia* Microsoft CE, EPOC Symbian, Palm O/S, and the like.

One envisaged multi-user application involves a series of question and answer procedures for staging a consumer survey, a multi-player game, and the like. The question and answer routines typically terminate in the transmitting of either a PTP feedback message to only those subscribers who actively participated or alternatively a PTMP feedback message to all subscribers irrespective of whether they actively participated or not. Another envisaged multi-user application is the secure distribution over PTMP of a wide range of typically high value encoded Content on Demand (CoD) offerings such as multi-

media clips, financial information, and the like. In this case, only subscribers who typically have expressed their interest in the CoD offerings, and are prepared to pay for them in accordance with a predetermined Schedule of Charges in a similar manner to Video on Demand (VoD) offerings, for example, per offering, as part of a subscription to a service, and the like, receive PTP messages containing the decoding information necessary for the decoding of the encoded CoD offerings for enabling their display on the subscribers' personal cellular telecommunications devices. And finally, another envisaged multi-user application is the staggered broadcast of the same PTMP interactive display message promoting a product or service over different geographical areas served by different Base Transceiver Stations (BTSs) for load balancing purposes, for example, at a call center having sales representatives for taking calls from subscribers who are interested in the product or service.

Brief Description of the Drawings

In order to understand the invention and to see how it can be carried out in practice, preferred embodiments will now be described, by way of non-limiting examples only, with reference to the accompanying drawings, in which similar parts are likewise numbered, and in which:

Fig. 1 is a schematic representation of a mobile cellular telecommunications network for supporting a multi-user application;

Fig. 2 is a schematic representation of a database record of an exemplary consumer survey question *"WHICH US PRESIDENTIAL CANDIDATE WOULD YOU VOTE FOR?"*;

Fig. 3 is a schematic representation of a database record of an exemplary Who Wants To Be a Millionaire multi-player game question *"WHICH INVENTOR WAS GRANTED THE MOST US PATENTS?*;

Fig. 4 is a flow diagram for staging a consumer survey over the mobile cellular telecommunications network of Figure 1;

Figs. 5A and 5B are schematic representations of display messages displayed on a subscriber's personal cellular telecommunications device during the staging of the consumer survey;

Figs. 6A and 6B are flow diagrams for a Content on Demand (CoD) application charged in accordance with a subscription plan, and a pay-as-you-view basis, respectively; and

Fig. 7 is a schematic representation showing the staggered broadcast of an exemplary PTMP interactive display message *"SAVE $$$$ WITH OUR NEW MORTGAGE PLAN. PRESS OK FOR DETAILS"* over a wide geographical area.

Detailed Description of the Drawings

Figure 1 shows a mobile cellular telecommunications network 1 including a plurality of individually addressable Base Transceiver Stations (BTSs) 2 each providing bidirectional signal coverage to a plurality of subscribers within a predefined geographical area. The BTSs 2 are each capable of transmitting Point-To-MultiPoint (PTMP) SMS messages to subscribers' personal cellular telecommunications devices 3 in their respective geographical areas. The BTSs 2 are also each capable of transmitting and receiving Point-To-Point (PTP) SMS messages to and from subscribers' personal cellular telecommunications devices 3 in their respective geographical areas. The mobile cellular telecommunications network 1 is connected to a server 4 for supporting one or more multi-user applications including multi-user interactive applications.

One such multi-user application is a consumer survey application employing a database 6 having database records 7 (see Figure 2) including the following fields: An identifier field containing a question number for identifying a question. A question field containing a question. And, an answer field containing two or more possible answers to the question in the associated question field.

Another such multi-user application is a Who Wants To Be A Millionaire type multi-player game based on questions stored in database records 8 (see

Figure 3) similar to those of a consumer survey question but additionally including the following fields from left to right: An answer field containing four possible answers to the question. A correct answer field indicating the correct answer to the question. An additional information field indicating the order of incorrect answers to be crossed out in the case that a subscriber requests additional information. And finally, a score field indicating the high score to be awarded to a subscriber who answers a question correctly without any additional information, and a low score in the case that he answers a question correctly after having seen additional information.

The staging of a consumer survey within the geographical area covered by a single BTS 2 is as follows: The server transmits a PTMP SMS display message for displaying the question *"WHICH US PRESIDENTIAL CANDIDATE WOULD YOU VOTE FOR?"* together with the names of the two US presidential candidates on the personal cellular telecommunications devices of each subscriber in the selected geographical area (see Figure 5A). Each subscriber wishing to participate in the consumer survey, proceeds to press the answer pushkey corresponding to his choice for US president, for example, a subscriber would press the pushkey "1" to vote for George Bush. On pressing one of the answer pushkeys, his personal cellular telecommunications device transmits a Point-to-Point (PTP) SMS response message including the question identifier, and his answer to the question to the server. The server determines the total number of subscribers who answered the question within a predetermined interval, say, 2 minutes from its initial broadcast, and determines the breakdown of votes between the two US presidential candidates. The server transmits a second PTMP SMS feedback message *"THE RESULTS OF THE POLL ARE: GEORGE BUSH 6,707, AL GORE 6,678 TOTAL 13,385"* for display on the personal cellular telecommunications devices of all the subscribers in the selected geographical area (see Figure 5B).

The staging of a Who Wants To Be A Millionaire type multi-player game is similar to the staging of a consumer survey except that it can optionally include

one or more steps. In the simplest implementation involving the same three steps as the staging of a consumer survey, the last step would typically include displaying the feedback message: *"THE CORRECT ANSWER IS THOMAS EDISON. 12,153 OUT OF 17,167 SUBSCRIBERS ANSWERED CORRECTLY"*. A more sophisticated implementation may include providing additional information in the form of incorrect answers being scored out to help a subscriber to answer a question correctly. The additional information can be shown either in response to a subscriber asking for additional information, or automatically after a predetermined amount of time. Also, in the case of an incorrect answer, a subscriber may be prompted as to whether he wants additional information to be shown, if he wants to answer the question again, and the like. These optional steps can be executed by the server or alternatively by client applications running on subscribers' personal cellular telecommunications devices themselves.

Subscribers can subscribe to a service providing Content on Demand (CoD) offerings, for example, up-to-date financial news, say, on the hour every hour. Such subscribers typically receive a PTP decoding information message, say, everyday at 00:00, containing the decoding information for decoding the CoD offerings of that service which they will receive on a regular basis for as long as they keep up their subscription to the service (see Figure 6A). In this manner, the encoded content is immediately decoded on its receipt at a subscriber's personal cellular telecommunications device. Against this, in the case of a CoD application being charged on a pay-as-you-go basis, the PTP decoding information message is only sent pursuant to a subscriber expressing his interest in viewing an encoded COD offering promoted in a PTMP interactive display message transmitted preferably after the encoded CoD offering such that the response time until a subscriber can view the CoD offering is minimized (see Figure 6B). Exemplary CoD offerings on a pay-as-you-go basis could include multi-media news items, goal replays at football matches, and the like. Depending on several factors including the sensitivity of the CoD offerings, their

frequency, their size, and the like, the CoD offerings can be either merely scrambled or fully encrypted, for example, using the standard 56-DES algorithm.

Figure 7 shows the use of the mobile cellular telecommunications network 1 for the staggered broadcast of the same PTMP interactive display message at a different BTS 2A, ..., 2E, and 2F each covering a different area at 20 minute intervals starting at 21:00. Assuming that the interactive display message includes an embedded callback number to a call center 9 having sales representatives for taking calls from subscribers interested in hearing more details about the mortgages, the calls arriving at the call center 9 would be spread over more time than if the interactive display message would be broadcasted at all the BTSs 2A, ... 2E, and 2F simultaneously.

While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications, and other applications of the invention can be made within the scope of the appended claims.

Claims

1. For use in a mobile cellular telecommunications network having at least one individually addressable Base Transceiver Station (BTS) providing bi-directional signal coverage to a plurality of subscribers within a predefined geographical area, a method for executing a multi-user interactive application, the method comprising the steps of:

(a) transmitting a Point-to-MultiPoint (PTMP) interactive display message at at least one BTS for display on the personal cellular telecommunications devices of each subscriber located within their respective geographical areas;

(b) receiving non-voice call response messages from subscribers' personal cellular telecommunications devices in response to the interactive display message; and

(c) transmitting one or more feedback messages for displaying interactive application related information on the personal cellular telecommunications devices of at least those subscribers who in step (b) invoked non-voice call response messages.

2. The method according to claim 1 wherein step (c) includes transmitting a PTMP feedback message at each of the at least one BTSs of step (a).

3. The method according to either claim 1 or 2 wherein the multi-user interactive application includes at least one question and answer procedure in which a subscriber is required to select an answer to a question from a plurality of answers.

4. The method according to claim 3 wherein the multi-user interactive application is a consumer survey application, and the interactive application related information in respect of a question includes at least the most popular answer to the question.

5. The method according to claim 4 wherein the interactive application related information in respect of a question includes a breakdown of the number of subscribers who selected each answer to the question.

6. The method according to claim 3 wherein the multi-user interactive application is a multi-player game application in which a question has a single correct answer, and the interactive application related information in respect of a question includes at least the number of subscribers who answered the question correctly.

7. The method according to claim 6 wherein the interactive application related information in respect of a question also includes the total number of subscribers who answered the question.

8. The method according to claim 6 wherein a subscriber can request additional information whereupon one or two incorrect answers are scored out.

9. A computer program loadable into a computer so that the computer programmed in this way is capable of or adapted to carrying out a method in accordance with any one of claims 1 to 8.

10. A program storage device readable by a computer and tangibly embodying a program of instructions for carrying out a method in accordance with any one of claims 1 to 8.

11. A mobile cellular telecommunications network for carrying out a method in accordance with any one of claims 1 to 8.

12. For use in a mobile cellular telecommunications network having at least one individually addressable Base Transceiver Station (BTS) providing bi-

directional signal coverage to a plurality of subscribers within a predefined geographical area, a method for supporting a Content on Demand (CoD) application, the method comprising the steps of:

(a) transmitting Point-To-MultiPoint (PTMP) encoded content at at least one BTS for receipt at the personal cellular telecommunications devices of each subscriber within their respective geographical areas; and

(b) selectively transmitting Point-To-Point (PTP) decoding information messages to subscribers' personal cellular telecommunications devices, the decoding information messages including the decoding information for decoding the encoded content prior to its display on the subscribers' personal cellular telecommunications devices.

13. The method according to claim 12 wherein the encoded content is transmitted after the PTP decoding information message.

14. The method according to claim 12 and further comprising the step of transmitting a PTMP interactive display message at the at least one BTS of step (a) whereupon, conditional on and pursuant to a subscriber having invoked a response mechanism in the PTMP interactive display message, transmitting the PTP decoding information message to his personal cellular telecommunications device.

15. The method according to claim 14 wherein the encoded content is transmitted prior to the PTP decoding information message.

16. The method according to claim 15 wherein the encoded content is transmitted prior to the PTMP interactive display message.

17. A computer program loadable into a computer so that the computer programmed in this way is capable of or adapted to carrying out a method in accordance with any one of claims 12 to 16.

18. A program storage device readable by a computer and tangibly embodying a program of instructions for carrying out a method in accordance with any one of claims 12 to 16.

19. A mobile cellular telecommunications network for carrying out a method in accordance with any one of claims 12 to 16.

20. For use in a mobile cellular telecommunications network having at least one individually addressable Base Transceiver Station (BTS) providing bi-directional signal coverage to a plurality of subscribers within a predefined geographical area, a method for displaying a Content on Demand (CoD) offering on a subscriber's personal cellular telecommunications device, the method comprising the steps of:

(a) receiving encoded content; and

(b) receiving a decoding information message including decoding information for decoding the encoded content prior to its display on the personal cellular telecommunications device.

21. The method according to claim 20 and further comprising the steps of:

(c) receiving an interactive display message; and

(d) invoking a Point-To-Point transmission response mechanism of the interactive display message to receive the decoding information message from the mobile cellular telecommunications network.

22. A computer program loadable into a computer so that the computer programmed in this way is capable of or adapted to carrying out a method in accordance with either claim 20 or 21.

23. A program storage device readable by a computer and tangibly embodying a program of instructions for carrying out a method in accordance with either claim 20 or 21.

24. A personal cellular telecommunications device for carrying out a method in accordance with either claim 20 or 21.

25. For use in a mobile cellular telecommunications network having at least one individually addressable Base Transceiver Station (BTS) each capable of transmitting at least Point-To-MultiPoint (PTMP) messages to a plurality of subscribers within a predefined geographical area, a method for broadcasting a PTMP display message comprising the steps of:

(a) transmitting a PTMP display message at at least one BTS for display on the personal cellular telecommunications devices of each subscriber located within their respective geographical areas; and

(b) subsequently and iteratively repeating step (a) at at least another BTS an integer number of times i where i=1, 2, 3, ..., n, thereby staggering the broadcast of the PTMP display message.

26. The method according to claim 25 wherein a PTMP display message is a PTMP interactive display message.

27. A computer program loadable into a computer so that the computer programmed in this way is capable of or adapted to carrying out a method in accordance with either one of claim 26 or 27.

28. A program storage device readable by a computer and tangibly embodying a program of instructions for carrying out a method in accordance with either one of claim 26 or 27.

29. A mobile cellular telecommunications network for carrying out a method in accordance with either one of claim 26 or 27.

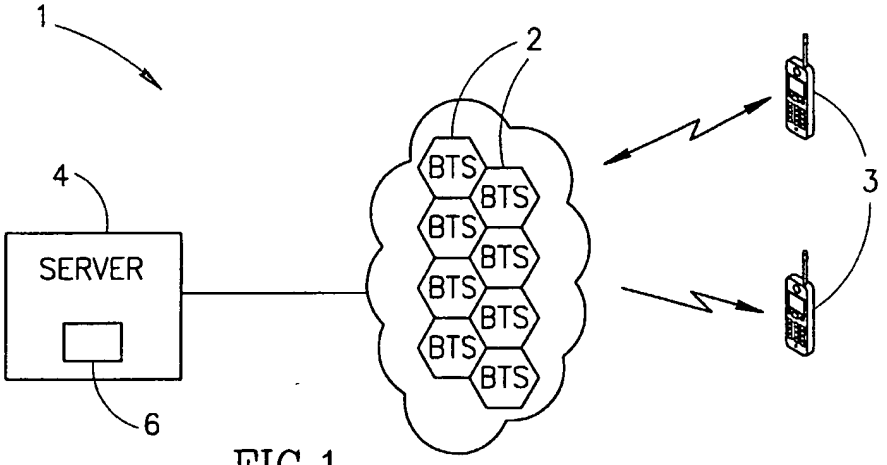

FIG.1

7

ID	QUESTION	ANSWER
134	WHICH US PRESIDENTIAL CANDIDATE WOULD YOU VOTE FOR ?	1. GEORGE BUSH 2. AL GORE

FIG.2

8

ID	QUESTION	ANSWER			
168	WHICH INVENTOR WAS GRANTED THE MOST US PATENTS ?	1. THOMAS EDISON 2. ALBERT EINSTEIN 3. BILL GATES 4. HENRY FORD	1	3 4 2	5 3

FIG.3

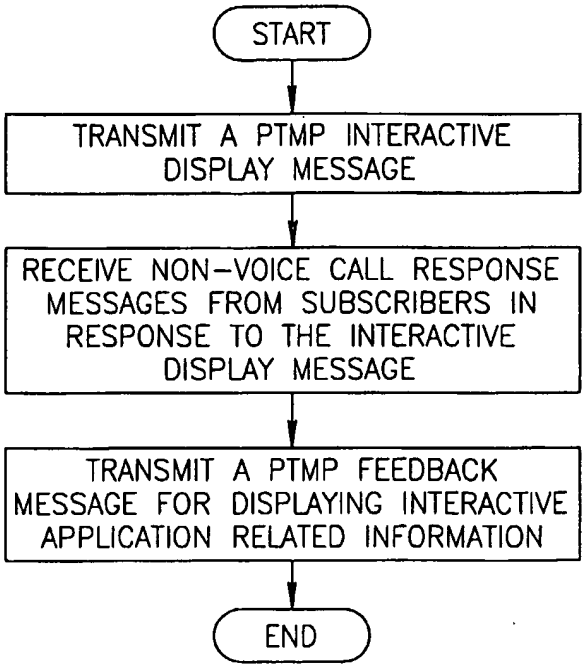

FIG.4

WHICH US PRESIDENTIAL CANDIDATE WOULD YOU VOTE FOR ?

1. PRESS 1 FOR GEORGE BUSH
2. PRESS 2 FOR AL GORE

FIG.5A

THE RESULTS OF THE POLL ARE:

1.	GEORGE BUSH	6,707
2.	AL GORE	6,678
	TOTAL	13,385

FIG.5B

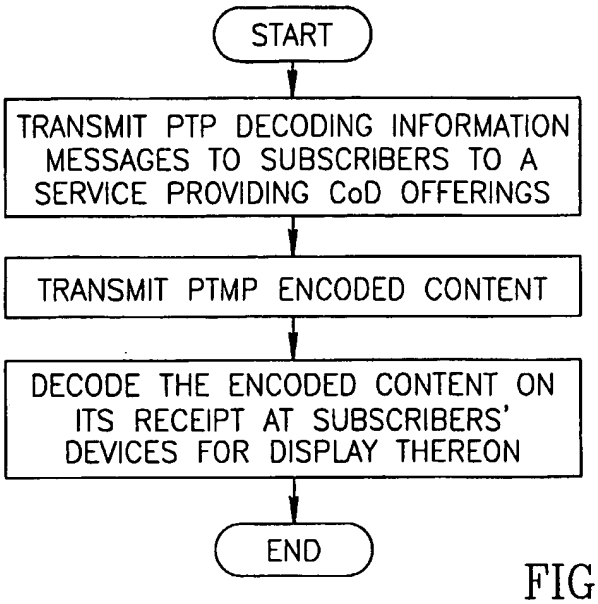
START
TRANSMIT PTP DECODING INFORMATION MESSAGES TO SUBSCRIBERS TO A SERVICE PROVIDING CoD OFFERINGS
TRANSMIT PTMP ENCODED CONTENT
DECODE THE ENCODED CONTENT ON ITS RECEIPT AT SUBSCRIBERS' DEVICES FOR DISPLAY THEREON
END

FIG.6A

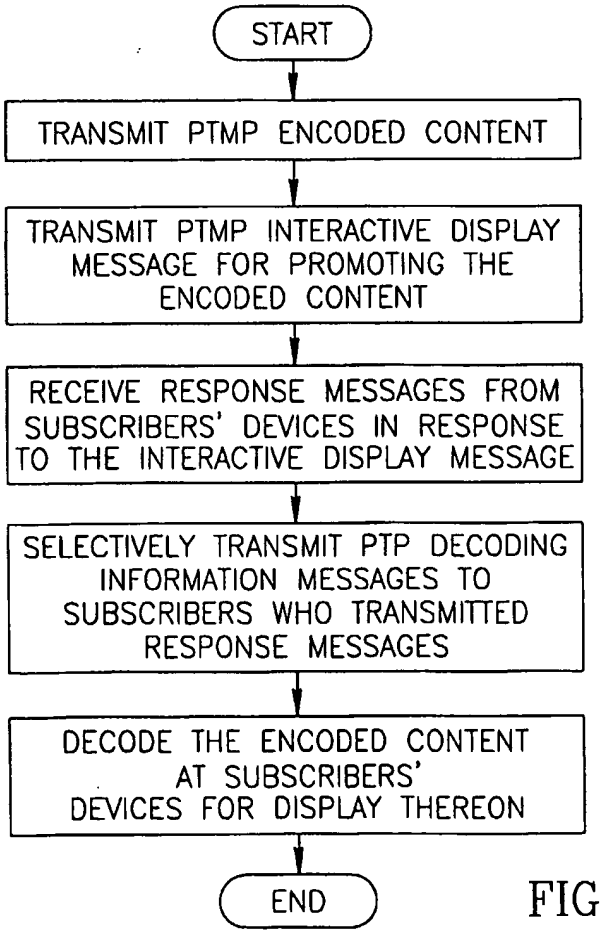
START
TRANSMIT PTMP ENCODED CONTENT
TRANSMIT PTMP INTERACTIVE DISPLAY MESSAGE FOR PROMOTING THE ENCODED CONTENT
RECEIVE RESPONSE MESSAGES FROM SUBSCRIBERS' DEVICES IN RESPONSE TO THE INTERACTIVE DISPLAY MESSAGE
SELECTIVELY TRANSMIT PTP DECODING INFORMATION MESSAGES TO SUBSCRIBERS WHO TRANSMITTED RESPONSE MESSAGES
DECODE THE ENCODED CONTENT AT SUBSCRIBERS' DEVICES FOR DISPLAY THEREON
END

FIG.6B

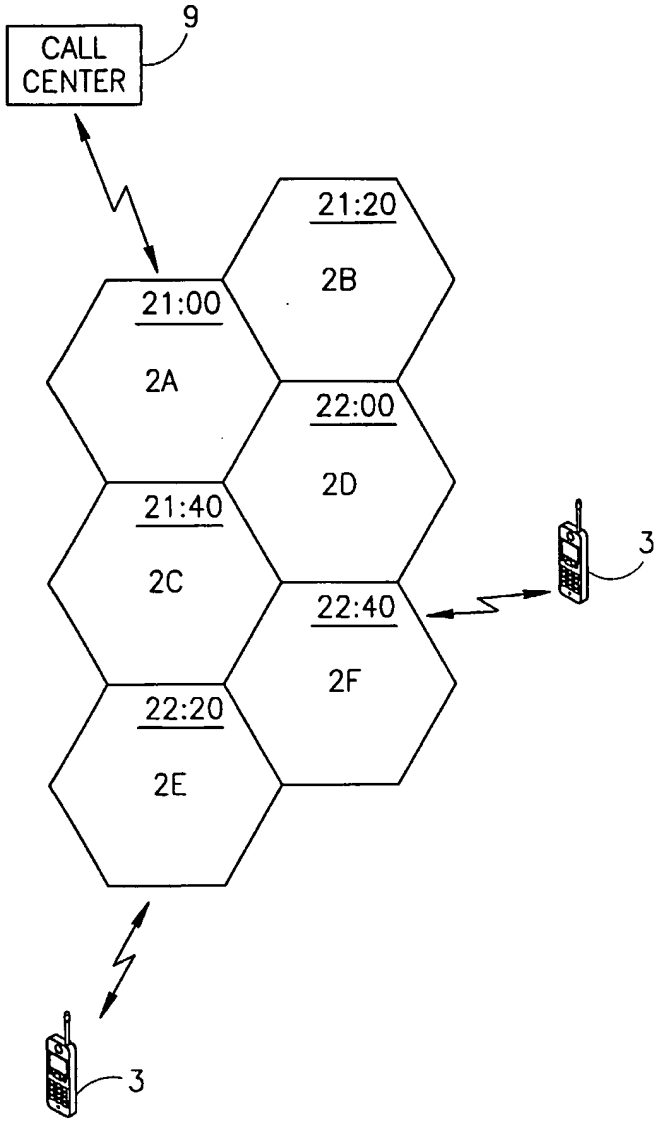

FIG.7

INTERNATIONAL SEARCH REPORT

Inte al Application No
PCI/IL 01/00381

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 10604 A (NOKIA MOBILE PHONES LTD ;NOKIA MOBILE PHONES INC (US)) 12 March 1998 (1998-03-12) page 3, line 24 - line 25 page 4, line 18 - line 26 page 5, line 25 -page 6, line 5 page 6, line 21 -page 7, line 11 page 11, line 1 -page 12, line 13 page 12, line 26 - line 32 page 13, line 10 -page 14, line 10 ---	1-11, 25-29
X	GB 2 327 567 A (ORANGE PERSONAL COMM SERV LTD) 27 January 1999 (1999-01-27) page 1, line 11 - line 17 page 3, line 5 -page 4, line 15 page 12, line 21 -page 13, line 8 page 14, line 8 -page 15, line 7 page 21, line 5 - line 13 --- -/--	12-20, 22-24

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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Date of the actual completion of the international search	Date of mailing of the international search report
9 January 2002	23/01/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Bernedo Azpiri, P

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INTERNATIONAL SEARCH REPORT

Inte — nal Application No
PCT/IL 01/00381

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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E	WO 01 45317 A (ERICSSON INC) 21 June 2001 (2001-06-21) page 6, line 15 - line 19 page 10, line 5 - line 19 page 17, line 3 - line 21	21

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

rmation on patent family members

Inte[illegible] al Application No
PC[illegible] 01/00381

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			WO	9810604 A1	12-03-1998
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